XVIII. *An Account of certain perfect minute Cryſtal Stones, by* J. Parſons, *M. D. & F. R. S.*

Read June 27. 1745. THE Drawing here annexed, TAB. III. *Fig.* 10. repreſents a ſmall Cryſtal magnified; it is one of a great Number brought by a very curious Gentleman from *Gibraltar*, who has cauſed many of them to be ſet in Buckles of different Kinds, for the Wear of his Lady and himſelf: And altho' they are formed and poliſh'd by Nature; yet they look very bright, and produce a very good Effect in the Buckles.

They were found accidentally. This Gentleman ſaw a Man cleaving a Rock near that Town, and obſerv'd a great Quantity of fine black Powder fall from its Crevices; and, being very curious, he examined the Powder, and found theſe little Stones in Cluſters, conſiſting of no more than twelve or fourteen each; and each Cluſter lying at conſiderable Diſtances from one another. They are all of the ſame Form, ſome leſs perfect than others, and are in general Hexagonals.

XIX. *A Letter from Mr.* John Ellicot, *F. R. S. to the* Preſident, *concerning the* ſpecific Gravity *of* Diamonds.

Read July 4. 1745. AS, from ſome Experiments I have lately had the Opportunity of making, it appears highly probable, that what has formerly

merly been publiſhed concerning the ſpecific Gravity of Diamonds, is not to be depended upon; I hope a ſhort Account of theſe Experiments will not be unacceptable to you, eſpecially as I do not find the leaſt Notice taken of the ſpecific Gravity of Diamonds in any of the Tables publiſhed in the *Philoſophical Tranſactions*.

In the Account the Honourable Mr. *Boyle* has given of Diamonds (as publiſhed by Dr. *Shaw*, in his Abridgment of that Gentleman's Philoſophical Works *), he relates it "as the Opinion of a famous "and experienced Cutter of Diamonds, that ſome "rough Diamonds were conſiderably heavier than "others of the ſame Bigneſs, eſpecially if they were "cloudy or foul; and Mr. *Boyle* mentions one that "weigh'd 8 Grains and $\frac{8}{16}$; which, being carefully "weigh'd in Water, according to the Rules of "Hydroſtatics, proved to an equal Bulk of that "Liquor, as 2 $\frac{2}{3}$ to 1; ſo that, as far as could "be judged by that Experiment, a Diamond weighs "not thrice ſo much as Water." And yet, in this Table of ſpecific Gravities, that of a Diamond is ſaid to be to Water as 3400 to 1000, or as 3, 4. to 1; and therefore, according to theſe two Accounts, there ſhould be ſome Diamonds, whoſe ſpecific Gravity ſhall differ nearly the $\frac{1}{8}$ from others; which I am perſuaded, is a much greater Difference than could be expected in any Bodies of the ſame kind, or that which, on a more nice Examination, will be found to be in Diamonds.

The

* Pag. 83. Vol. V. new Edition of Mr. *Boyle*'s Works in *folio*.

The firſt Diamonds I had the Opportunity of ſeeing weigh'd, were two very large ones from the *Braſils*, which were furniſhed by Mr. *Chace*, a Merchant in *Auſtin-friers*: The ſpecific Gravities of theſe were found to be much greater than the heavieſt of Mr. *Boyle*'s, the one being to an equal Bulk of Water as 3518, and the other as 3521 to 1000, and the Difference between them leſs than the one-thouſandth Part. There were two ſmaller *Braſil* Diamonds weigh'd at the ſame time, which indeed were not quite ſo heavy as the former, the lighteſt being but as 3501, the other as 3511; but, as theſe were of the ſame kind, and comparatively ſmall, I judged this Difference could not be much depended on. Having therefore an Opportunity ſome time ſince of a large Parcel of *Eaſt-India* Diamonds, I choſe out 10, which, both in Shape and Colour, and every other reſpect, were as different from each other as poſſible. Theſe being weigh'd in the ſame Scales and Water as the former, the lighteſt proved to be as 3512, and the heavieſt as 3525; the very near Agreement of theſe laſt with each other, and with the former, tho' weigh'd at about eight Months Diſtance, makes it highly probable, that ſo great a Difference as appears from the Place above-cited, and Mr. *Boyle*'s Table, is not to be found in any Diamonds whatſoever, much leſs ſo great a Difference as appears between the lighteſt of his and the heavieſt of mine, being above $\frac{1}{7}$ of the Whole.

I had never made any Experiments myſelf, by which I could form a Judgment, how much of the Difference between theſe and former Trials might ariſe from the different Tempers and Qualities of the

Waters uſed; warm Water being lighter than cold, and Pump-Water generally heavier than River-Water. But, taking it for granted, that all Perſons who make ſuch Experiments uſe common and not Mineral Waters, and Waters of the natural Temper, and not heated deſignedly, I am aſſured by a Friend, who has made many careful Trials for this particular Purpoſe (an Account of which he has promiſed me ſhall be laid before the *Royal Society*), that the ſpecific Gravity of any Body will not differ above $\frac{1}{200}$ at the moſt, on account of the Quality of the Water and Temper taken together; whereas the heavieſt of Mr. *Boyle*'s Diamonds, as in his Tables, differs from the lighteſt of mine by above one Thirty-fifth Part, which is about ſix times as much as $\frac{1}{200}$: And yet I can think of no other Way of accounting for the reſt of this Difference; unleſs it ſhould ariſe from the Smallneſs of the Diamonds, or any Defect in the Inſtruments with which his Experiments were made.

The Scales in which theſe Diamonds were weigh'd turned very ſenſibly with the two-hundredth Part of a Grain; and as one of the Diamonds weighed above 92 Grains, it was capable of being weighed to leſs than the 18000th Part: ſeveral of them were weigh'd twice over both in Water and Air, and the Weights found to agree to the greateſt Exactneſs; and if to this is added the very near Agreement of the Weights of the ſeveral Diamonds, tho' weigh'd at different Times, and at a conſiderable Diſtance, from each other, I think it highly improbable, that there could be any conſiderable Miſtake in theſe Trials; and therefore

their ſpecific Gravities, as in the following Table, may fully be depended on.

I have ſet down the Weights of the ſeveral Diamonds both in Air and Water, that if any Miſtake ſhould have happened, it may be the more eaſily rectified. I am, Sir, with the greateſt Reſpect,

Your obedient humble Servant,

John Ellicott.

N°.		In Air	In Water	Specif. Grav.
	Water	. .	. .	1000
		Grains	Grains	
1	A *Brazil* Diamond, fine Water, rough Coat	92,425	66,16	3518
2	A *Brazil* Diamond, fine Water, rough Coat	88,21	63,16	3521
3	Ditto. fine bright Coat, ...	10,025	7,170	3511
4	Ditto. fine bright Coat, ...	9,560	6,830	3501
5	An *Eaſt India* Diamond, pale blue, . .	26,485	18,945	3512
6	Ditto bright yellow	23,33	16,71	3524
7	Ditto. very fine Water, bright Coat,	20,66	14,8	3525
8	Ditto. very bad Water, honeycomb Coat,	20,38	14,59	3519
9	Ditto. very hard blewiſh Caſt, . .	22,5	16,1	3515
10	Ditto. very ſoft, good Water, . .	22,615	16,2	3525
11	Ditto. a large red foul in it. . . .	25,48	18,23	3514
12	Ditto. ſoft bad Water	29,525	21,140	3521
13	Ditto. ſoft brown Coat, ...	26,535	18,99	3516
14	Ditto. very deep green Coat, . . .	25,25	18,08	3521

The mean Specific Gravity of the *Brazil* Diamonds appears to be 3513.
The mean of the *Eaſt-India* Diamonds, : : : 3519.
The mean of Both to be : : : : 3517.